

## **REMARKS**

In the Office Action ("OA"), the Examiner rejected claims 1-3 and 6 under 35 U.S.C. § 102(e) as anticipated by Kim, U.S. Pat. Pub. No. 2001/0036730 ("*Kim*"); rejected claims 1-6 and 9 under 35 U.S.C. § 103(a) as unpatentable over *Kim* in view of Cooper et al., U.S. Patent No. 5,219,793 ("*Cooper*"); and rejected claims 7 and 8 under 35 U.S.C. § 103(a) as unpatentable over *Kim* in view of Chang et al., U.S. Patent No. 6,159,842 ("*Chang*") and further in view of Tsai et al., U.S. Patent No. 6,331,480 ("*Tsai*"). Applicants address these rejections separately below.

### **I. Response to Rejections Under 35 U.S.C. § 102(e)**

The Examiner rejected claims 1-3 and 6 under section 102(e) as anticipated by *Kim*. In response, Applicants assert that *Kim* fails to anticipate claims 1-3 and 6 because *Kim* fails to teach all of the claim elements.

In order to properly anticipate Applicants' claimed invention under 35 U.S.C. § 102(e), each and every element of the claim in issue must be found, either expressly described or under principles of inherency, in a single prior art reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." M.P.E.P. § 2131, ed. 8, rev. 1 (Feb. 2003) (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236 (Fed. Cir. 1989)). Finally, "[t]he elements must be arranged as required by the claim." M.P.E.P. § 2131 at 2100-70.

Claim 1 is directed to a method for forming contact openings comprising a combination of elements including, *inter alia*, "c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening."

*Kim* is directed to a method of forming DRAM cell capacitors. *Kim* discloses that the a contact hole 112 is formed through an oxide layer 106 using photoresist pattern layer 110. *Kim*, ¶ 19. The Examiner asserted that etching the contact hole using photoresist pattern layer 110 of *Kim* corresponds to etching recited in claim 1. However, *Kim* does not teach or even suggest an etching mask defining a straight line shape. *Kim* discloses that the etching process is used to form contract hole 112 in which a contact plug will be formed. In fact, bit line 107 of *Kim* is not exposed through contact hole 112. *Kim*, Fig. 2A.

Moreover, the Examiner asserted that silicon nitride spacer 113 of *Kim* corresponds to insulating layers on the sidewalls as recited in claim 1. (OA at 3.) However, silicon nitride spacer 113 of *Kim* is formed on the sidewalls of contact hole 112 not on sidewalls of bit line 107. *Kim*, Fig. 2B.

Thus, *Kim* fails to teach or suggest at least “c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening,” as recited in claim 1.

Accordingly, *Kim* fails to anticipate claim 1. For at least this reason, claim 1 is allowable.

Claims 2, 3, and 6 are allowable at least due to their dependence from allowable claim 1.

## **II. Response to Rejections under 35 U.S.C. § 103(a)**

The Examiner rejected claims 1-6 and 9 under section 103(a) as unpatentable over *Kim* in view of *Cooper* and rejected claims 7 and 8 under section 103(a) as unpatentable over *Kim* in view of *Chang* and further in view of *Tsai*. In response, Applicants submit that a *prima facie* case of obviousness has not been established for these claims.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim

elements. Furthermore, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03 (quoting *In re Wilson*, 424 F.2d 1382, 1385 (C.C.P.A. 1970)). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. M.P.E.P. § 2143 at 2100-122 to 127.

A *prima facie* case of obviousness has not been established for either rejection because the cited references fail to teach or suggest all the claim elements. Applicants will address each rejection separately.

**A. Kim in view of Cooper (Claims 1-6 and 9)**

Claim 1 recites, *inter alia*, "c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening."

As mentioned above in section I., *Kim* fails to teach or suggest at least these claim elements. Furthermore, the Examiner does not allege that *Cooper* teaches or suggests these claim steps. In fact, *Cooper* also fails to teach or suggest these steps. *Cooper* merely discloses forming an insulating layer 22 and an etching layer 20 using a photoresist mask 24. See *Cooper*, Fig. 2 and col. 4, lines 38-67.

Therefore, since *Cooper* does not cure the deficiencies of *Kim*, *Kim* and *Cooper*, whether taken alone or in combination, fail to teach or suggest at least "c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening." Accordingly, a

*prima facie* case of obviousness has not been established for claim 1. For at least this reason, claim 1 is allowable.

Claims 2-6 and 9 are allowable at least due to their dependence from allowable claim 1. “If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” M.P.E.P. § 2143.03 at 2100-126 (citing *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988)).

**B. *Kim* in view of *Chang* and further in view of *Tsai* (Claims 7 and 8)**

Claims 7 and 8 depend indirectly from claim 1, and, thus, incorporate the elements of that claim. As mentioned above in section I., *Kim* fails to teach or suggest at least “c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening,” as recited in claim 1 and incorporated in claims 7 and 8.

Likewise, *Chang* and *Tsai* fail to teach or suggest at least this claim element. In fact, neither *Chang* or *Tsai* teach or suggest forming insulating layers on sidewalls of bit line patterns. *See Chang*, Fig. 3 and *Tsai*, Fig. 12.

Therefore, since *Chang* and *Tsai* does not cure the deficiencies of *Kim*, *Kim*, *Chang*, and *Tsai*, whether taken alone or in combination, fail to teach or suggest at least “c) etching [an] interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening.” Accordingly, a *prima facie* case of obviousness has not been established for claims 7 and 8. For at least this reason, claims 7 and 8 are allowable.

### **III. Conclusion**

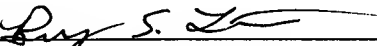
In view of the foregoing, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: February 19, 2004

By:   
Bryan S. Latham  
Reg. No. 49,085

FINNEGAN  
HENDERSON  
FARABOW  
GARRETT &  
DUNNER LLP

1300 I Street, NW  
Washington, DC 20005  
202.408.4000  
Fax 202.408.4400  
www.finnegan.com